Lesson Log-3/11/04
Day #5 Length of Class-46 min

What did you expect students to learn during the lesson? During this shortened class (professional development day) I expected the students who had not yet completed their data collection for the inquiry activity to do so. This was necessary so we could examine each lab group's data and results and identify common findings. I wanted the students to come to the conclusion that reaction time can indeed be affected by a variety of factors. I expected that students would come to the conclusion that observation of reaction time involved processing some stimulus through the brain, and that because of the extra steps, this would take longer. I expected students to correctly identify the dependent and independent variables in their experiments. I also wanted them to identify some of the variables they had to control in their experiment.

Students read a sample from the Merck Manual of Geriatrics which deals with reaction time and the elderly. We also explored the issue of reaction time and driving. One of the major risk factors for spinal cord injury is motor vehicle collision among younger people. From what I have observed in this school there is a definite "Fast and Furious" car culture that encourages unsafe driving. Instead of having the students read yet another scare tactic handout they looked at people at the other end of the life spectrum and saw from the graphs just how unsafe teen drivers were as a whole.

Describe the learning activities and the use of resources to support students' learning of the lessons' main concept and/or processes. Class began quickly as students read the sample from the Merck manual. Two graphs were included, and I wanted students to extract information from the graphs to answer a question set at the beginning of class. After a few minutes of quiet work, students participated by answering the questions aloud for participation points. Answers to the questions were clarified, and I displayed the graphs that the students had in front of them on an overhead. The large spike representing accidents at the teenage groups was fairly obvious. From here a couple of students had to complete the lab activity, and I allowed the lab groups to examine their findings before we discussed the results. As part of their grade for the lab, students had to describe their findings to the class. This went quickly as students explained their findings for the lab. Because the students' experiments were varied, analyzing data for commonality was not really helpful. It was better to describe the data in terms of how reaction times changed in

response to changes in the independent variables. I asked the students what their conclusions were, and how valid their data was. With few exceptions most students realized that an experiment that tests only a few trials or subjects has inherent flaws.

Describe how you monitored students' learning and what you found about their understanding of the lesson's main concepts. Overall the students did a good job identifying the variables and using the CAPT terminology of dependent and independent variables. Virtually all the groups stated that their data has problems in that they used small sample sizes and a similar population. I asked the question how you could improve your experiment without changing the methods. One student who compared reaction time of boys versus girls quickly stated he would like to test as many people in the school as possible. I asked the class if this was a good idea and they agreed. The students clearly recognized that sample size plays an important role in experimental validity. An issue that came up was variables that needed to be controlled in the experiment. We made a list on the board of some of the variables that had to be controlled. Factors identified by the students included: the height of the ruler drop must remain the same, the person dropping the ruler must be the same every time and the arm of the test subject must be isolated on a desk. Most groups were able to observe some variance in reaction time as a result of their experiment. It was also important that reflexes were mostly observed as unchanging. It was interesting to see just how varied the independent variables were. Some students were concerned that arm length could affect reaction time as it provides a longer pathway for the impulse to travel. Other students investigated height, gender or whether the student participated in sports or video games.

Describe the instructional adjustments you made in response to your findings about students' learning needs during the lesson. During the analysis of the bell-work, the discussion of the large number of accidents started to become kind of preachy. Some of my students recently got their learner permits and said things like: "You are starting to sound like my parents." I steered the discussion back to reaction time and focused the students on the fact that reaction time does change with age. The discussion of the lab results showed that several students were having trouble grasping the concepts of dependent and independent variables. At this point in their high school career, students need to nail down those terms so that it does not come back to haunt them in the CAPT. I used time to clarify those terms in the context of their inquiry lab. The data was shared by having the students state their findings for the class.

Bellwork (5 points)

5/5

1. According to the graph provided with the sample, which age group has the highest rate of motor vehicle collisions overall?
   The graph group that has the highest rate of motor vehicles is the teenager.
2. Are the elderly responsible for a larger number of collisions?
   No they are not responsible for a larger amount of collisions
3. List some reasons why elderly drivers are involved in fewer collisions than younger drivers?
   they drive slower
   they are more cautious
   they don't drive during traffic hours they drive less than a younger person
4. Where on the road are elderly drivers more likely to have a collision? They are most likely to have accidents in an intersection.
5. Explain what happens to reaction time as you age?
   As you age your reaction time slows down and becomes
   Why does it slow down?
   Because of Memory loss!

Chapter 23. The Elderly Driver

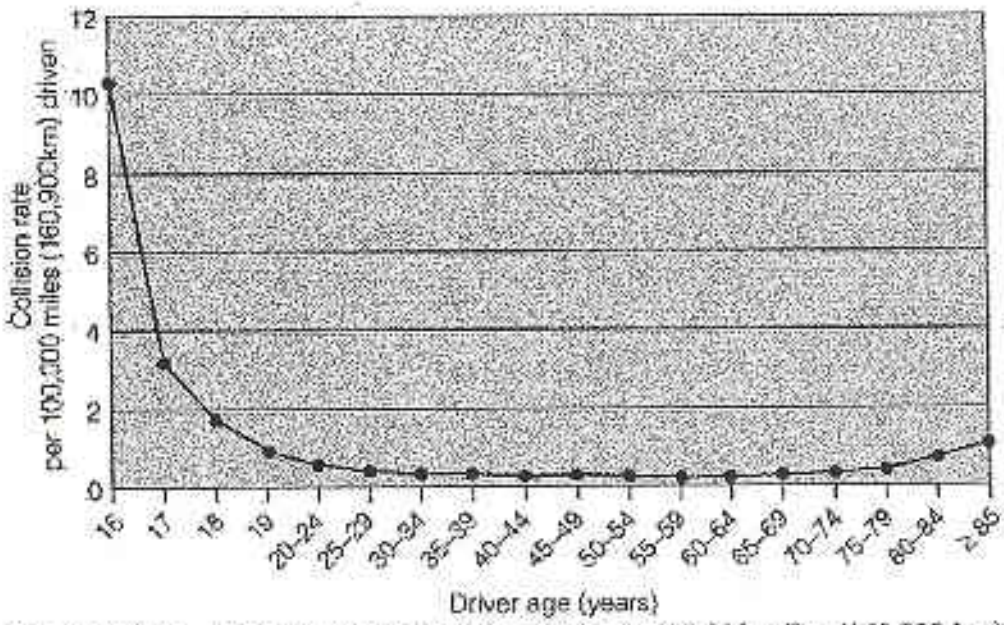


FIGURE 23–2. Motor vehicle collision rates per 100,000 miles (160,900 km) driven, according to age. From Cerrelli EC. *Crash data and rates for age-sex groups of drivers, 1994.* Research Note. National Highway Traffic Safety Administration Technical Report, October 1995.

Chapter 23. The Elderly Driver

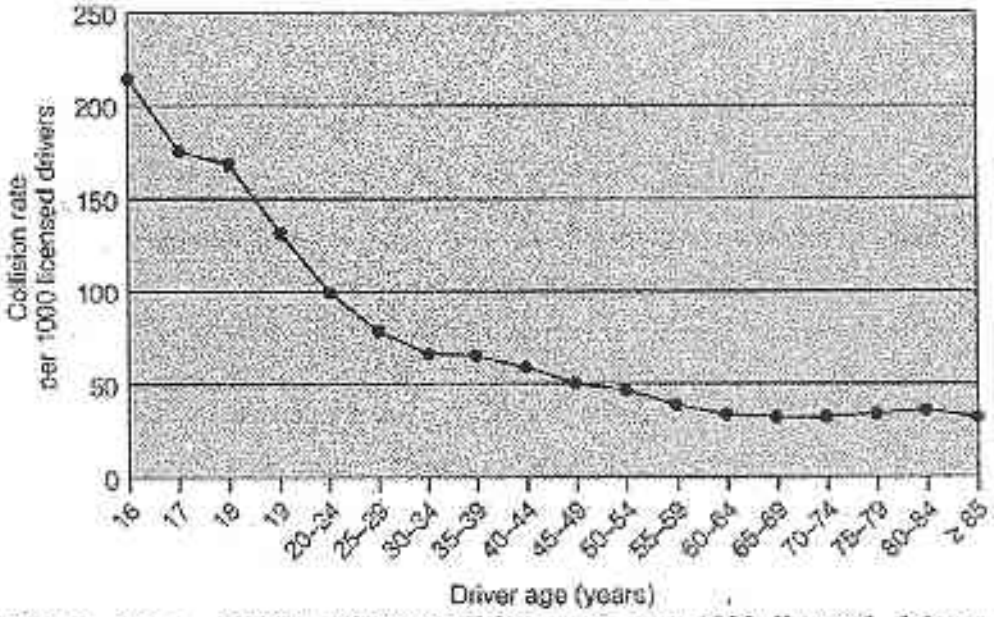
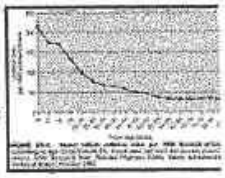


FIGURE 23–1. Motor vehicle collision rates per 1000 licensed drivers, according to age. From Cerrelli EC. *Crash data and rates for age-sex groups of drivers, 1994.* Research Note. National Highway Traffic Safety Administration Technical Report, October 1995.

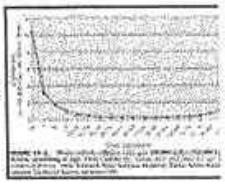
Chapter 23. The Elderly Driver

For most community-dwelling elderly persons, being able to drive is essential for maintaining autonomy in daily activities (eg, shopping, medical appointments, social visits church functions). For elderly persons who cannot drive, alternative transportation should be arranged, although such arrangements often involve dependence on family members and friends. The use of public transportation, even if available, is often unacceptable because of inconvenience, cost, or concerns about safety.

Safe driving requires the integration of complex motor, visual, and cognitive tasks, although many drivers with moderate motor, visual, and cognitive deficits can continue to drive safely, probably because these tasks have been consolidated into a learned, instinctive pattern of driving. Performance is usually affected only after considerable loss of function.



To compensate for moderate functional deficits, most elderly persons avoid rush hour and drive fewer miles, shorter distances, and less at night. For instance, average mileage is 64% less for 85-year-old male drivers than for 65-year-old male drivers. Elderly drivers are also more cautious than younger drivers, drive more slowly, and take fewer risks in traffic. Because elderly persons drive less than younger persons and because they are more cautious, they have fewer collisions. Collision rates (per 1000 licensed drivers) decrease steadily with age (see Figure 23-1). Thus, it is a myth that elderly drivers are responsible for a disproportionate number of motor vehicle collisions.



However, per mile driven, elderly drivers have higher rates of traffic violations, collisions, and fatalities than all age groups over age 25. Collision rates per mile driven increase after about age 70 and increase more rapidly after age 80 (see Figure 23-2). Failure to yield right-of-way and failure to heed a stop sign or red light are the most common violations. Furthermore, elderly drivers have a higher proportion of collisions at intersections. These findings imply that some elderly drivers have difficulty with driving tasks requiring complex decision making.

Elderly drivers involved in collisions fare worse than younger drivers. Collisions involving elderly drivers are more likely to include multiple vehicles and to result in serious injuries and fatalities, partially because the elderly have different driving patterns and because they

Post Lab Discussion(14 points) 11/14 3/11/24

1. What were some of the variables you tried to control in your experiment?(2 points)

+2 height of the meter stick
the technique
also the exercising time.

2. Did any of the other lab groups have the same controls? What were some of the controls that you had in common with other lab groups? (2 points)

+2 The height of the meter stick

3. What were you trying to measure in this experiment? (2 points)

+2 In the experiment we were trying to measure and compare the reaction time and relex from an athletic and a non athletic person

4. Identify the dependent (*responding*) variable in your experiment? (2 points)

+1 The ~~reaction time, after and before exercise~~ reaction time, and the reflex
WHAT REFLEX DID YOU OBSERVE?

The independent was the exercises

5. Identify the independent (*manipulated*) variable(s) in your experiment? (2 points)

+2 exercises, and ~~time~~
"Athletic" vs non-Athletic" males and females

6. Explain how poor technique in dropping the meter stick could have affected the reaction time data? (2 points)

† 2 The poor technique in dropping the meter stick because it might speed it up or slower it.

7. How would you improve, refine or take your experiment further? (2 points)

† 2 I would improve by using more samples.